Minnesota Department of Health
121 East Seventh Place
P.O. Box 64975
St. Paul, MN 55164-0975

June 11, 1996

Mr. Scott E. Anderson
Superintendent of Utilities
City of St. Louis Park
Utility Operations
3752 Wooddale Avenue
St. Louis Park, Minnesota 55416-2216

Dear Mr. Anderson:

In November of 1995, the city of St. Louis Park and the Minnesota Pollution Control Agency asked the Minnesota Department of Health (MDH) to assist in determining whether or not the Methodist Hospital well, Well No. 48 (Unique No. 216067), would need to be pumped to achieve capture of contaminated water in the Prairie du Chien-Jordan (OPCJ) aquifer. The MDH and Hennepin Conservation District had constructed an Analytic Element Model of this aquifer for the county to delineate the capture zones of municipal wells for wellhead protection. As an independently developed model specifically designed to address the impact of high capacity wells, this model seemed to be an ideal means to address the Reilly OPCJ contamination issue.

The city of St. Louis Park supplied the pumping rates for the wells to be used in the model, Table 1. The modeling results are summarized in the following two figures: Summer Conditions and Winter Conditions, respectively. Each line on the maps represent the distance that water will flow in 100 years. Scenarios one through three were specified by the city. Scenario four was done by MDH as an example of the level of pumping that is needed to achieve capture under summer pumping conditions. In scenario four the pumping of Wells Nos. 6 (Unique No. 206457) and 14 (Unique No. 227965) were switched.

The modeling results show that pumping rates and locations of the wells to be pumped, as supplied by the city, are adequate for all parts of the city except for the southwestern quadrant. Note that this quadrant includes the Reilly site itself. Capture of the water under the Reilly site is not achieved in any of the summer pumping scenarios specified by the city and is only achieved in scenario four. Capture is better during the winter; however, it is not adequate for positive capture of all contaminated water. It is likely that contamination would escape along the southwestern boundary of the city under winter pumping conditions as specified.

Therefore, it is recommended that additional modeling runs be performed to address the appropriate pumping rates for Well No. 48 and SLP No. 6 (Unique No. 206457) to achieve capture of the contaminated water and prevent it from impacting municipal wells in other communities.

I look forward to your response and to working with you further on this problem. If you have any questions, please contact me at (612) 215-0797.

Sincerely,

Justin L. Blum, Hydrogeologist
Special Services Unit
Drinking Water Protection Section

JLB:tvs
Enclosures
cc: Mr. Michael Rardin, Public Works Director, City of St. Louis Park
Mr. William Gregg, ENSR
Mr. Jim Pennino, Minnesota Pollution Control Agency

Table 1.

Pumping Scenarios for Optimal Capture of PAH Plume in OPCJ Aquifer

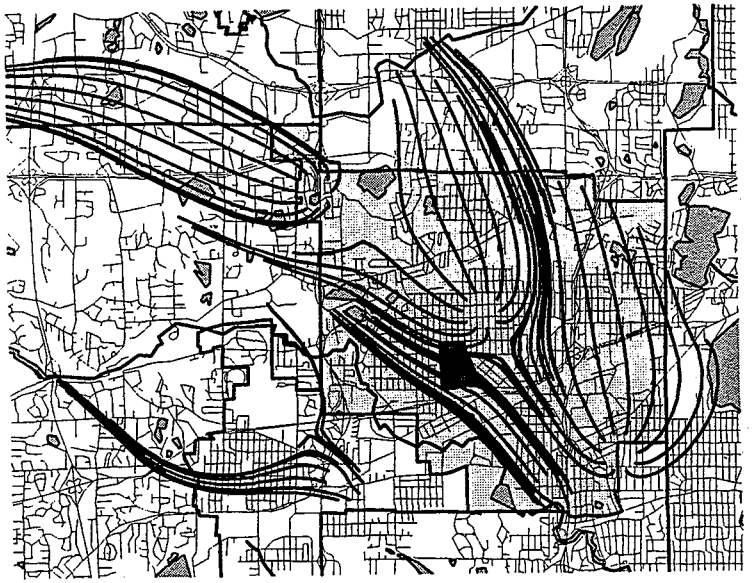
City of St. Louis Park											
PCJ Pumping Scenario # 1											
UNQ #	200542	206457	203678	206442	227965	203187	216050	206444	453805	206454	216067
	SLP 4	SLP 6	SLP8	SLP10	SLP14	SLP16	W23	W40	W401	W29	W48
JAN	44.05	1.20	40.20	40.20	1.20	1.20	2.40	0.29		0.01	
FEB	39.76	1.20	36.30	36.30	1.20	1.20	2.30	0.29		0.02	
MAR	44.05	1.20	40.20	40.20	1.20	1.20	2.40	0.29		0.04	
APR	42.60	1.20	43.20	43.20	1.20	1.20	2.30	0.29		0.01	
MAY	44.05	1.20	44.60	44.60	4.00	10.00	2.40	0.29	2.00	0.01	
JUN	54.00	6.00	51.80	47.50	6.00	14.00	2.30	0.29	2.00	0.04	
JUL	60.00	10.00	51.80	47.50	10.00	22.00	2.40	0.29	2.00	0.04	
AUG	60.00	8.00	51.80	47.50	10.00	18.00	2.30	0.29	2.00	0.08	
SEP	44.05	1.20	38.90	43.20	4.00	1.20	2.30	0.29	2.00	0.11	
OCT	44.05	1.20	40.10	40.20	1.20	1.20	2.40	0.29		0.09	
NOV	39.76	1.20	38.90	38.80	1.20	1.20	2.30	0.29		0.10	
DEC	44.05	1.20	40.10	40.20	1.20	1.20	2.40	0.29		0.08	
	560.42	34.80	517.90	509.40	42.40	73.60					
	W 48 pumps a total of 750,000 gallons per year with no change in future										
	W 119 is not in use and no pumping is projected										

City of St. Louis Park											
PCJ Pumping Scenario # 2											
SLP 14 First Step											
UNQ #	200542	206457	203678	206442	227965	203187	216050				
	SLP4	SLP6	SLP8	SLP10	SLP14	SLP16	W23	W40	W401	W29	
JAN	44.05	1.20	40.20	40.20	1.20	1.20	2.40	0.29		0.01	
FEB	39.76	1.20	36.30	36.30	2.50	1.20	2.30	0.29		0.02	
MAR	44.05	1.20	40.20	40.20	3.80	1.20	2.40	0.29		0.04	
APR	42.60	1.20	43.20	43.20	15.00	1.20	2.30	0.29		0.01	
MAY	44.05	3.00	44.60	44.60	52.00	10.00	2.40	0.29	2.00	0.01	
JUN	54.00	10.00	51.80	47.50	48.90	10.00	2.30	0.29	2.00	0.04	
JUL	60.00	10.00	51.80	47.50	52.00	10.00	2.40	0.29	2.00	0.04	
AUG	60.00	10.00	51.80	47.50	52.00	10.00	2.30	0.29	2.00	0.08	
SEP	44.05	3.00	38.90	43.20	46.00	1.20	2.30	0.29	2.00	0.11	
OCT	44.05	1.20	40.10	40.20	10.00	1.20	2.40	0.29		0.09	
NOV	39.76	1.20	38.90	38.80	1.20	1.20	2.30	0.29		0.10	
DEC	44.05	1.20	40.10	40.20	1.20	1.20	2.40	0.29		0.08	
	560.42	44.40	517.90	509.40	285.80	49.60					
	W 48 pumps a total of 750,000 gallons per year with no change in future										
	W 119 is not in use and no pumping is projected										

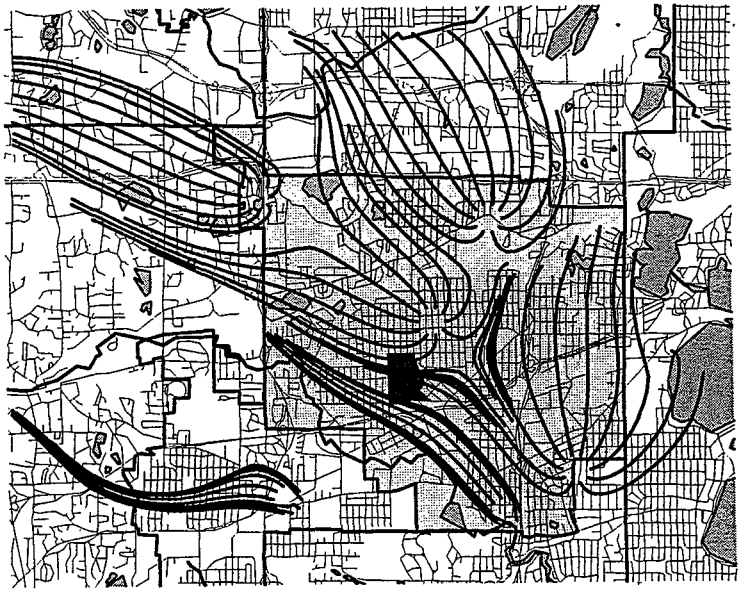
City of St. Louis Park											
PCJ Pumping Scenario # 3											
UNQ #	200542	206457	203678	206442	227965	203187	216050				
	SLP4	SLP6	SLP8	SLP10	SLP14	SLP16	W23	W40	W401	W29	
JAN	44.05	1.20	1.20	40.20	1.20	40.20	2.40	0.29		0.01	
FEB	39.76	1.20	1.20	36.30	2.50	36.30	2.30	0.29		0.02	
MAR	44.05	1.20	1.20	40.20	3.80	40.20	2.40	0.29		0.04	
APR	42.60	1.20	1.20	43.20	15.00	43.20	2.30	0.29		0.01	
MAY	44.05	3.00	10.00	44.60	52.00	44.60	2.40	0.29	2.00	0.01	
JUN	54.00	10.00	10.00	47.50	48.90	51.80	2.30	0.29	2.00	0.04	
JUL	60.00	10.00	10.00	47.50	52.00	51.80	2.40	0.29	2.00	0.04	
AUG	60.00	10.00	10.00	47.50	52.00	51.80	2.30	0.29	2.00	0.08	
SEP	44.05	3.00	1.20	43.20	46.00	38.90	2.30	0.29	2.00	0.11	
OCT	44.05	1.20	1.20	40.20	10.00	40.10	2.40	0.29		0.09	
NOV	39.76	1.20	1.20	38.80	1.20	38.90	2.30	0.29		0.10	
DEC	44.05	1.20	1.20	40.20	1.20	40.10	2.40	0.29		0.08	
	560.42	44.40	49.60	509.40	285.80	517.90					
	W 48 pumps a total of 750,000 gallons per year with no change in future										
	W 119 is not in use and no pumping is projected										

Pumping scenario #4 is the same as #2 but with the pumping quantities of #14 (227965) and #6 (206457) reversed. That is the quantities needed in the system are the same but #6 would be used much more to make up for the loss of #48 (216067) and would probably capture all the water that flows under the Reilly Site.

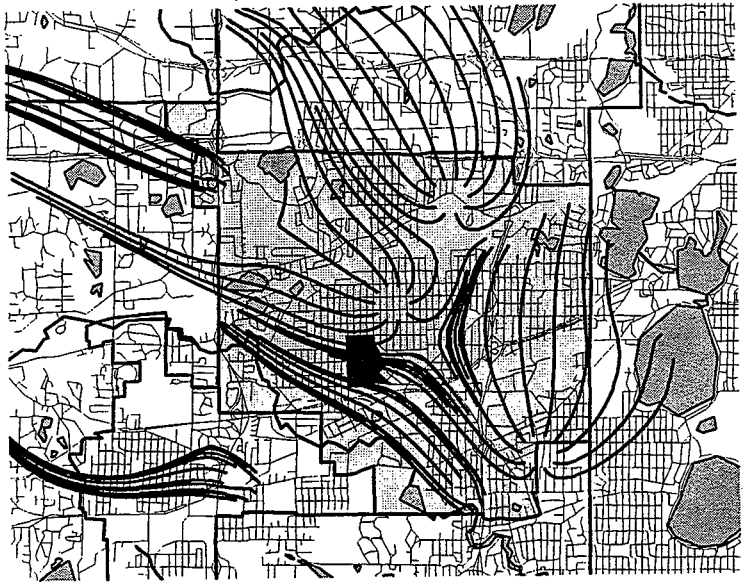
HCD/MDH - OPCJ Flow Model Results for St. Louis Park
Summer Conditions



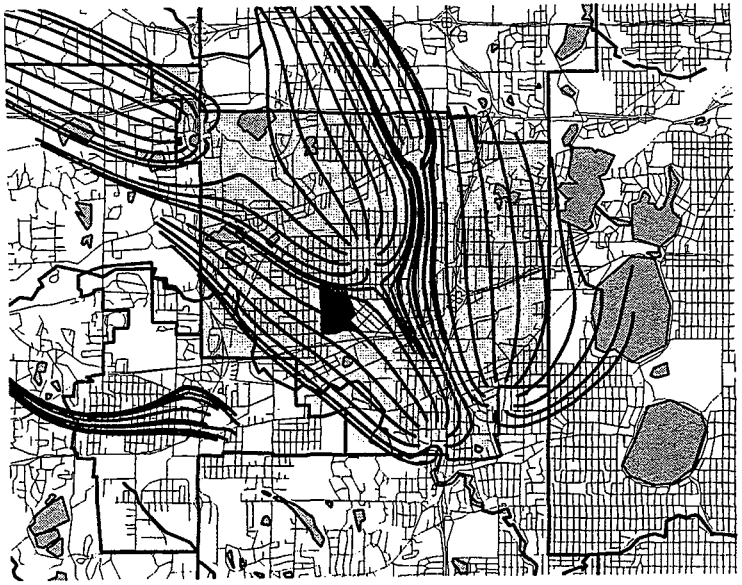
Pumping Scenario 1



Pumping Scenario 2

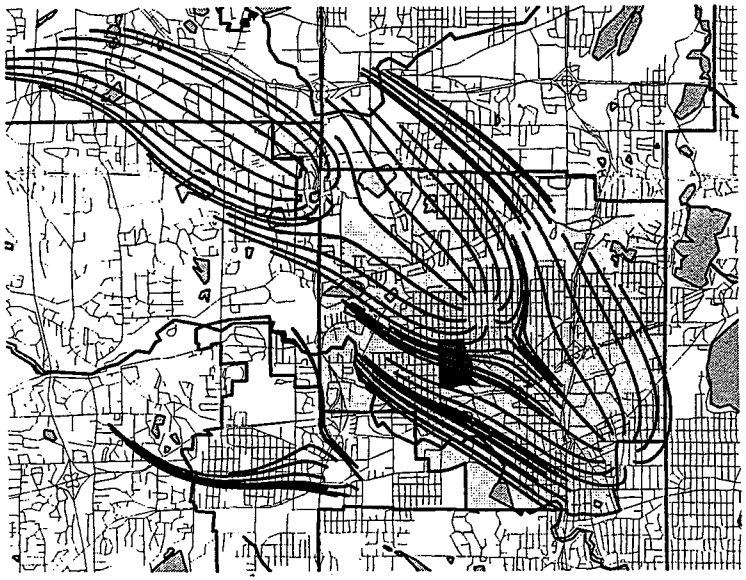


Pumping Scenario 3

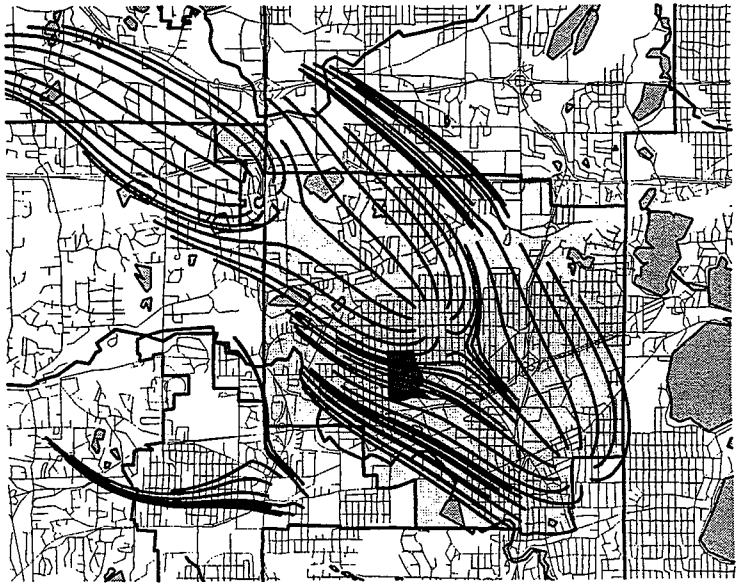


Pumping Scenario 4

HCD/MDH - OPCJ Flow Model Results for St. Louis Park
Winter Conditions



Pumping Scenario 1



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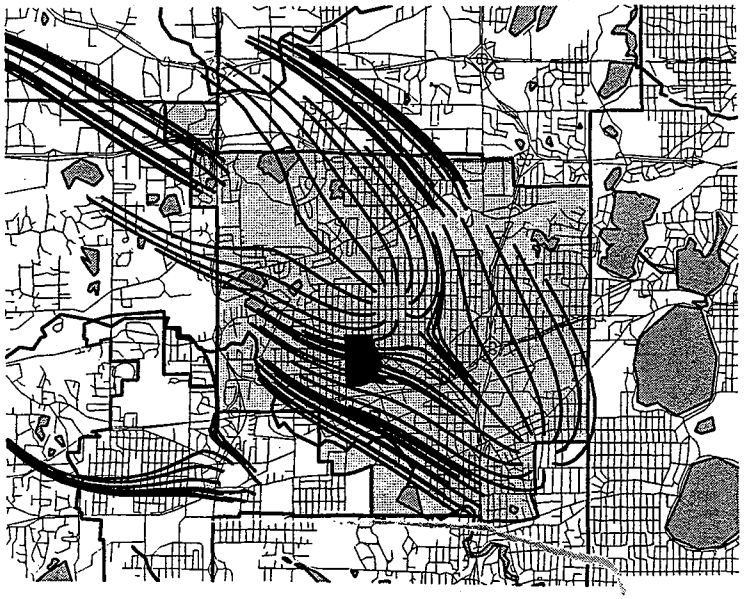
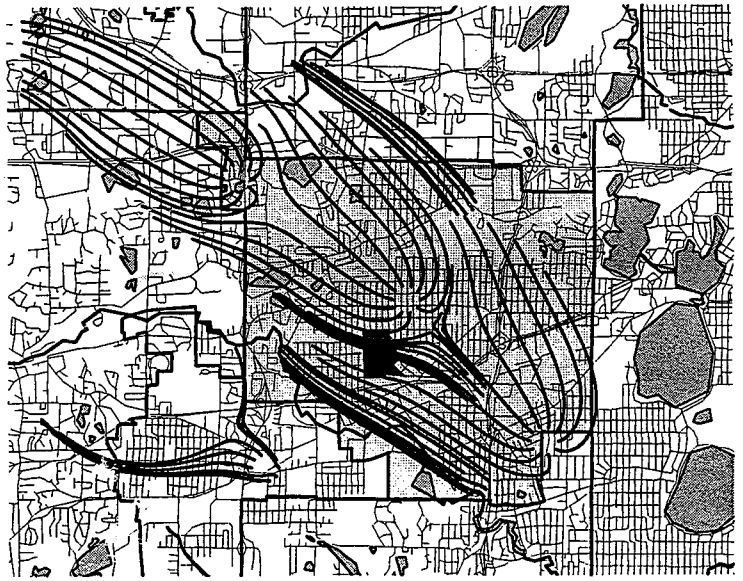


Pumping Scenario 3



Pumping Scenario 4